

8. (Five Times Amended) A method for decoding data into original data comprising:

decompressing a compressed version of input data into a plurality of transformed signals, including context modeling bits of the plurality of transformed signals based on known transformed signals in other frequency bands and neighboring transformed signals in the same frequency band; and

generating a reconstructed version of original data from the plurality of transformed signals with an overlapped inverse reversible wavelet transform, wherein the overlapped inverse reversible wavelet transform is implemented in integer arithmetic such that, with integer coefficients, integer reconstructed original data is losslessly recoverable.

12. (Five Times Amended) A method for processing input data comprising: generating a first plurality of transformed signals in response to the input data with a reversible overlapped wavelet transform using a pair of non-minimal length reversible filters, implemented in integer arithmetic such that, with integer signals, integer input data is losslessly recoverable;

compressing the first plurality of transformed signals into data representing a compressed version of the input data, including context modeling the first plurality of transformed signals based on known transformed signals in other frequency bands and neighboring transformed signals in the same frequency band;

decompressing the compressed version of the input data into a second plurality of transformed signals; and

generating the input data from the second plurality of transformed signals into a reconstructed version of the input data with an inverse reversible overlapped wavelet transform using a second pair of non-minimal length reversible filters.

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13. (Five Times Amended) A method for encoding input data comprising:
transform encoding the input data into a series of coefficients with an overlapped reversible wavelet transform, wherein the overlapped reversible wavelet transform is implemented in integer arithmetic such that, with integer coefficients, integer input data is losslessly recoverable; and

embedded coding the series of coefficients, including ordering the series of coefficients, performing bit significance embedding on the series of coefficients, wherein a first type of embedded coding is performed on a first portion of the data and a second type of embedded coding is performed on a second portion of data using context modeling based upon known coefficients in other frequency bands and neighboring coefficients in the same frequency band.

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17. (Five Times Amended) A method for encoding input data comprising:
transforming input data into a series of coefficients with an overlapped reversible wavelet transform, wherein the overlapped reversible wavelet transform is implemented in integer arithmetic such that, with integer coefficients, integer input data is losslessly recoverable;

converting the series of coefficients into sign-magnitude format to produce a series of formatted coefficients;

coding a first portion of the series of coefficients using a first type of embedded coding to produce a first bit stream;

coding a second portion of the series of formatted coefficients using a second type of embedded coding that models data using known coefficients in other frequency bands and neighboring coefficients in the same frequency to produce a second bit stream; and coding the first bit stream and second bit stream into a single bit stream.

22. (Twice Amended) An encoder for encoding input data into a compressed data stream, said encoder comprising:

a reversible wavelet filter to transform the input into a plurality of coefficients, wherein the reversible wavelet filter is implemented in integer arithmetic such that, with integer coefficients, integer input data is losslessly recoverable;

an embedded coder coupled to the reversible wavelet filter to perform embedded coding on the plurality of coefficients to generate a bit stream, when the embedded coder comprises a context model to model data based on known coefficients in other frequency bands and neighboring coefficients in the same frequency band; and

an entropy coder coupled to the embedded coder to perform entropy coding on the bit stream to create coded data.

23. (Twice Amended) An encoder for encoding input data comprising:

a transform coder coupled to receive the input data and generate a series of coefficients to represent a decomposition of the input data using an overlapped reversible wavelet transform, wherein the overlapped reversible wavelet transform is implemented

in integer arithmetic such that, with integer coefficients, integer input data is losslessly recoverable; and

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an embedded coder coupled to receive the series of coefficients and perform bit-significance encoding on the series of coefficients to create coded data, when the embedded coder comprises a context model to model data based on known coefficients in other frequency bands and neighboring coefficients in the same frequency band, the embedded coder producing the coded data as the series of coefficients are received.

32. (Twice Amended) A decoder for decoding input data comprising:

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a decompressor to decompress a compressed version of input data into a plurality of coefficients using context modeling based on known coefficients in other frequency bands and neighboring coefficients in the same frequency band; and

an overlapped inverse reversible wavelet transform coupled to the decompressor to generate a reconstructed version of original data from the plurality of coefficients, wherein the overlapped inverse reversible wavelet transform is implemented in integer arithmetic such that, with integer coefficients, integer reconstructed original data is losslessly recoverable.
